

River Bend Ranch Restoration and Passage Project

State(s): Wyoming

Managing Agency/Organization: Trout Unlimited

Type of Organization: Non-profit

Project Status: Ongoing

Project type: WNTI Project

Project action(s): Riparian or In-Stream Habitat Restoration, Watershed or Population Assessment, Monitoring, Education/Outreach. Restore stream and floodplain function on 2.5 miles of the upper Hoback River.

Trout species benefitted: Yellowstone Cutthroat Trout

Population: Upper Hoback River, Snake River Watershed, WY

Project summary: The River Bend Ranch Restoration and Passage Project Phase 2 is a collaborative effort to improve habitat for native Snake River Cutthroat Trout (Yellowstone Cutthroat Trout subspecies); stream, floodplain, and riparian function; and bank and channel stability on the upper Hoback River outside of Bondurant, Wyoming. The project is located on a mix of working cattle ranch, bison ranch, and Bridger-Teton National Forest (BTNF) lands, and is the site of the Wyoming Game and Fish Department's (WGFD) McNeel elk feed ground and a Jackson Hole Land Trust conservation easement. Seasonal fish passage barriers and habitat degradation as a result of instream disturbances from two gravel push-up dams were addressed through the project's first phase in 2018-2019 through the installation of a fish passage-friendly rock diversion and headgate structure at a stable location. The project's second phase seeks to treat the entire 2.5-mile river corridor from the new diversion to the Highway 191 bridge through an innovative approach that works with the river's ecological processes to address the collective impacts from cattle grazing, elk browse, diversions, and dikes. Techniques including fencing revegetation units, riparian fencing, brush bank streambank structures willow trenches, and floodplain roughness treatments will be used to stabilize vulnerable areas of the river's floodplain and encourage the re-establishment of riparian vegetation, which in turn will provide areas of scour and cover for improved habitat diversity. Together, these improvements will benefit fish habitat, stream stability, and agricultural operations in one of the most degraded sections of the Hoback River, a free-flowing tributary of the Snake River with a genetically pure, self-sustaining population of Snake River /Yellowstone Cutthroat Trout.

Problem the Project Addresses: The upper Hoback River in the project area, which encompasses two private ranches (River Bend Ranch and Jackson Fork Ranch) and BTNF lands, is a highly unstable channel that has resulted in reduced instream and riparian habitat for native fish and riparian-dependent wildlife, and threatens feed ground, irrigation, and ranching operations. The project area has a history of willow removal, heavy ungulate browse pressure, riparian cattle grazing, flood control through dikes and ditches, and flood irrigation through the use of gravel push-up dams, which have collectively contributed to the high levels of bank and channel instability evidenced throughout the property and low quality aquatic and riparian habitat.

Project partners first focused on the project area in 2016 when extreme bank erosion threatened the WGFD McNeel feed ground stackyard on the River Bend Ranch, which stores 500 tons of hay for winter elk feeding. While the bank adjacent to the stackyard was rip-rapped in December 2016 to prevent further bank loss, project partners realized that longer-term solutions would be needed to address the contributing factors of instability and loss of fish habitat in the area. In fall 2018 and spring 2019, the project's first phase addressed the impacts of annual instream disturbance from two gravel push-up dams (which had required excavators to manipulate the stream bed and banks multiple times a year to divert water) through a series of irrigation system improvements. The gravel push-up dams had resulted in degraded habitat for native fish and impeded fish passage seasonally and during low water years. The push-up dams were replaced with a single, fish-passage-friendly rock diversion and headgate structure in a stable location. Associated bank and channel treatments, and improvements to irrigation infrastructure in and around the new diversion, also benefited the ranch and feed ground operations, stream stability, fish habitat, and fish passage.

The project's second phase seeks to address the second major source of stream instability and degraded fish habitat in the area: the loss of historic woody riparian vegetation (cottonwoods and willows), which has resulted in floodplain instability, severe bank erosion, loss of land, stream channel abandonment and downcutting. Prior to land use changes for ranching and elk feed ground operations, the upper Hoback River in the project area would have been a multi-thread, braided, and stable channel with high floodplain connectivity, held together by a robust cottonwood and willow community and hosting a diversity of habitats for all life stages of native cutthroat trout. Loss of this vegetation has resulted in a lack of habitat diversity and quality (very little cover, pool habitat, and backwater habitat) and low densities of trout.

Objectives:

- Improve habitat quality and diversity and connectivity for all life stages of Snake River Yellowstone Cutthroat Trout and other native fish.
- Re-establish the woody riparian vegetation community of cottonwoods and willows through floodplain revegetation units and riparian fencing treatments
- Increase bank and channel stability and reduce risk to infrastructure through vegetated brush bank and floodplain roughness treatments at identified high-risk areas
- Improve water quality by reducing downstream sedimentation from erosion.

Native Fish Conservation Benefits

The Hoback River is a major tributary of the Snake River and is an important, wild, native Snake River / Yellowstone Cutthroat Trout (YCT) fishery. It is a popular fishery that is self-sustained by wild recruitment (no stocking) and is a high conservation priority because of the robust, genetically pure YCT populations found within the watershed. Fifty-three stream miles within the Hoback River watershed are part of the National Wild and Scenic Rivers System through the Craig Thomas Snake Headwaters Legacy Act, and several segments of stream have instream flow rights filed with the Wyoming State Engineer's Office for the benefit of the fishery and as a result of Wyoming Water Development Commission instream flow studies. The primary conservation outcomes are improved habitat and connectivity for genetically pure YCT and other native fish including Mountain Sucker and Mountain Whitefish in the upper Hoback River watershed, a freestone tributary of the Snake River. The project will also increase stream and floodplain function on a highly degraded stretch of the upper Hoback River identified as a strategic habitat priority area by the WGFD, and 49 stream miles (the downstream mileage of the Hoback River below the project area) will also benefit from lowered sediment inputs and improved fish passage. Additionally, the re-establishment of a thriving riparian zone will benefit elk, mule deer, and riparian-dependent songbirds.

Partners:

- U.S. Forest Service: Bridger-Teton National Forest
- Trout Unlimited
- Wyoming Game and Fish Department
- Trout Unlimited chapter: Jackson Hole
- Ricketts Conservation Foundation / Jackson Fork Ranch
- Private landowner
- Rocky Mountain Elk Foundation
- Sublette Conservation District
- Western Native Trout Initiative
- Wyoming Governor's Big Game License Coalition
- Wyoming Landscape Conservation Initiative / Bureau of Land Management
- Wyoming Water Development Commission
- Wyoming Wildlife and Natural Resources Trust

Project Monitoring: Trout Unlimited will develop a monitoring plan with WGFD and BTNF to evaluate and measure the success of the project. The monitoring plan will include pre- and post-construction longitudinal profile and channel cross-section measurements; fish population estimates; bank erosion rates calculated through a BANCS analysis to quantify sediment reduction; photo points; measurement of functional lift using the Wyoming Stream Quantification Tool; and aerial video comparisons by drone including orthomosaic imagery which can be used to assess changes in vegetation. The project design team will be tasked with construction oversight and will be responsible for verifying that the structures have been built according to plans and specifications. Quantifiable metrics include successful installation of the revegetation units (total number and area), floodplain roughness (total pieces of wood), and brush bank treatments (feet of bank stabilized) according to the project's design, increased functional lift using the WSQT, and any observed increases in fish population estimates.

Funding Source(s): National Fish Habitat Action Plan

Project cost: \$40,000 WNTI, Total project cost \$606,240

Start Date: 10/2022 **Completion Date:** 12/2024

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